

IN THE CLAIMS:

Please **AMEND** the claims as follows:

1. (Currently Amended) A method of producing silicon single crystals which comprises ~~employing,~~
~~in the step of:~~

pulling up a the silicon single crystal in the Czochralski method, with a cooling rate of not less than
7.3 °C/min in the single crystal temperature range of 1200-1050°C,

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value), and the single crystal is not nitrogen doped.

2. (Currently Amended) A method of producing silicon single crystals which comprises ~~employing,~~
~~in the step of:~~

pulling up a the silicon single crystal in the Czochralski method, with a cooling rate of not less than
7.3°C/min in the single crystal temperature range of 1200-1050°C; and then

cooling the single crystal at a cooling rate of not more than 3.5°C/min in the single crystal
temperature range of 1000-700°C,

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value), and the single crystal is not nitrogen doped.

3. (Canceled)

U.S. Patent Application Serial No. 09/883,922

4. (Currently Amended) A method of manufacturing epitaxial wafers which comprises ~~allowing:~~
forming an epitaxial layer to grow on the surface of a silicon wafer sliced from a silicon single crystal
produced by the Czochralski method ~~by employing with~~ a cooling rate of not less than 7.3 °C/min in the
single crystal temperature range of 1200-1050 °C ~~in the step of pulling up thereof.~~

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value), and the single crystal is not nitrogen doped.

5. (Currently Amended) A method of manufacturing epitaxial wafers which comprises ~~allowing:~~
forming an epitaxial layer to grow on the surface of a silicon wafer sliced from a silicon single crystal
produced by the Czochralski method ~~by employing with~~ a cooling rate of not less than 7.3 °C/min in the
single crystal temperature range of 1200-1050 °C; and then

cooling the single crystal at a cooling rate of not more than 3.5 °C/min in the single crystal
temperature range of 1000-700 °C ~~in the step of pulling up thereof.~~

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value), and the single crystal is not nitrogen doped.

6-7. (Canceled)

8. (Currently Amended) A method of producing silicon single crystals which comprises ~~employing,~~
~~in the step of:~~

U.S. Patent Application Serial No. 09/883,922

pulling up a silicon single crystal doped with 1×10^{12} atoms/cm³ to 1×10^{14} atoms/cm³ of nitrogen in the Czochralski method with:

cooling the silicon single crystal with a cooling rate of not more than 1.2°C/min in the single crystal temperature range of 1000-850°C,

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM '79 value).

9. (Currently Amended) A method of producing silicon single crystals which comprises ~~employing,~~ in the step of:

pulling up a silicon single crystal doped with 1×10^{12} atoms/cm³ to 1×10^{14} atoms/cm³ of nitrogen in the Czochralski method, with a cooling rate of not less than 2.7°C/min in the single crystal temperature range of 1150-1020°C, and then

cooling the silicon single crystal at a cooling rate of not more than 1.2°C/min in the single crystal temperature range of 1000-850°C,

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM '79 value).

10. (Currently Amended) A method of producing silicon single crystals which comprises ~~employing,~~ in the step of:

U.S. Patent Application Serial No. 09/883,922

pulling up a silicon single crystal doped with 5×10^{13} atoms/cm³ to 1×10^{16} atoms/cm³ of nitrogen in the Czochralski method, with a cooling rate of not less than 6.5°C/min in the single crystal temperature range of 1150-800°C.

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM '79 value).

11. (Currently Amended) A method of producing silicon single crystals as claimed in any of Claims ~~7 to 10~~ 8 to 10, wherein the single crystal has an oxygen concentration of not less than 4×10^{17} atoms/cm³ (ASTM '79).

12. (Canceled)

13. (Currently Amended) A method of manufacturing epitaxial wafers which comprises ~~allowing~~ forming an epitaxial layer to grow on the surface of a silicon wafer sliced from a silicon single crystal doped with 1×10^{12} atoms/cm³ to 1×10^{14} atoms/cm³ of nitrogen as produced by the Czochralski method ~~by employing; and then~~

cooling the epitaxial layer with a cooling rate of not more than 1.2°C/min in the single crystal temperature range of 1000-850°C ~~in the step of pulling up thereof.~~

wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM '79 value).

U.S. Patent Application Serial No. 09/883,922

14. (Currently Amended) A method of manufacturing epitaxial wafers which comprises ~~allowing~~
forming an epitaxial layer to grow on the surface of a silicon wafer sliced from a silicon single crystal
doped with 1×10^{12} atoms/cm³ to 1×10^{14} atoms/cm³ of nitrogen as produced by the Czochralski method
by ~~employing with~~ a cooling rate of not less than 2.7°C/min in the single crystal temperature range of 1150-
1020°C; and then
cooling the epitaxial layer at a cooling rate of not more than 1.2°C/min in the single crystal
temperature range of 1000-850°C ~~in the step of pulling up thereof~~;
wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value).

A1
15. (Currently Amended) A method of manufacturing epitaxial wafers which comprises ~~allowing~~
forming an epitaxial layer to grow on the surface of a silicon wafer sliced from a silicon single crystal
doped with 5×10^{13} atoms/cm³ to 1×10^{16} atoms/cm³ as produced by the Czochralski method ~~by~~
~~employing with~~ a cooling rate of not less than 6.5°C/min in the crystal temperature range of 1150-800°C
~~in the step of pulling up thereof~~;
wherein the single crystal has an oxygen concentration of not less than 12×10^{17} atoms/cm³ (ASTM
'79 value).

U.S. Patent Application Serial No. 09/883,922

16. (Currently Amended) A method of manufacturing epitaxial wafers as claimed in any of Claims

~~12 to 15~~ 13 to 15, wherein the silicon wafer sliced out has an oxygen concentration of not less than 4×10^{17}

~~12 to 15~~ 13 to 15, wherein the silicon wafer sliced out has an oxygen concentration of not less than 4×10^{17}
atoms/cm³ (ASTM '79).
